

## **REMARKS**

In response to the above-identified Office Action, Applicant amends claims 1, 3, 5, 6 and 10. Applicant does not add any claims. Applicant does not cancel any claims. Claims 1-10 remain in the application.

### **I. Claim Rejections under 35 U.S.C. §112**

The Patent Office objects to claims 3 and 10 under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Specifically, the Patent Office determines the phrase “the contribution” found in claims 3 and 10 lacks antecedent basis. Applicant respectfully submits the attached amended claims 3 and 10 correcting the deficiency noted by the Patent Office. Applicant respectfully requests the Patent Office withdraw the rejection of claims 3 and 10.

### **II. 35 U.S.C. §103(a): Rejection of Claims 1-2 and 4-5**

The Patent Office rejects claims 1-2 and 4-5 as being obvious over U.S. Patent No. 6,726,996 issued to Barth et. al. (“Barth”) in view of U.S. Patent No. 5,081,053 issued to Heremans et. al. (“Heremans”) and further in view of U.S. Pub. No. 2002/0003238 assigned to Ramdani et. al. (“Ramdani”).

Independent claim 1 describes an apparatus consisting of composite dielectric layers including a contact point formed on a device layer of a circuit substrate or interconnect layer on the substrate, a first dielectric layer comprised of cubic boron nitride on the substrate, a different second dielectric layer on the substrate separated from the device layer by a first dielectric layer and an interlayer contact having a length dimension extending through the first dielectric layer and the second dielectric layer to the contact point.

In order to render a claim obvious, the relied upon references must disclose every limitation of the claim such that the invention as a whole would have been obvious at the time the

invention was made to one skilled in the art. MPEP §2143. Furthermore, there must be a showing of suggestion or motivation to modify or combine the teachings of those references. *In re Rouffet*, 149 F.3d 1350, 1357, 47 USPQ2d 1453, 1457-58 (Fed. Cir. 1998).

Applicant respectfully submits claim 1 is prima facie not obvious over the cited references, because the references fail to teach at least a multi layer interconnect structure with an interlayer contact having a length dimension extending through a first cubic boron nitride dielectric layer and a different second dielectric layer to the contact point.

The Patent Office relies on Barth to teach all the limitations of claim 1 except for a first dielectric layer comprising cubic boron nitride. The Patent Office determines however the deficiencies in Barth are overcome through the combined teachings of Heremans and Ramdani. Applicant respectfully submits Barth teaches a top barrier layer formed over wiring regions of the multi layer interconnect structure. Heremans teaches a method of forming a transistor having a silicon active layer overlaying a cubic boron nitride layer which is in epitaxial registry with an underlying silicon substrate. Ramdani teaches a method of forming a substrate suitable for growing a cubic boron nitride layer over a silicon wafer. Applicant can find no reference in Barth, Hereman and Ramdani, alone or in combination, to a multi layer interconnect structure with alternating dielectric layers including a first cubic boron nitride layer and different second dielectric layer and further an interlayer contact with a length dimension extending through composite first and second dielectric layers to the contact point. As recited in Col. 1, lines 13-14, Barth teaches a “dielectric capping layer for interconnect structures.” Accordingly, the “wiring regions 22” of Barth as cited by the Patent Office do not have a length dimension extending through the first and second dielectric layers to the contact point. Applicant further notes as evidence the prior art does not disclose an interlayer contact having a length dimension, the Patent Office’s recognition on page 5 of the Office Action that Barth, Hereman and Ramdani fail to teach a contact body with a length dimension extending through the composite dielectric layer which includes a third dielectric material formed on the body as recited in claim 6.

There is likewise no motivation in the cited references to modify Barth to incorporate the teachings into a multi level interconnect structure because Barth is only concerned with the top barrier layer. As previously discussed Barth teaches a dielectric capping layer formed *over* an interconnect structure.

For the foregoing reasons, Applicant respectfully submits, the combined references do not teach or suggest every element of claim 1 therefore claim 1 is not obvious over the cited references. Claims 2 and 4-5 depend from claim 1 and therefore contain all the limitations of that claim. For at least the reasons stated with respect to claim 1, claims 2 and 4-7 are not obvious over the cited references.

### **III. Allowable Subject Matter**

Applicant notes with appreciation the Patent Office's indication that claims 6-9 contain allowable subject matter. The Patent Office suggests claims 6-7 would be allowable if rewritten in independent form including all the limitations of the base claim and any intervening claims. Applicant respectfully submits, in light of the amendment to claim 1 submitted herewith, claims 6-7 which depend from claim 1 are in condition for allowance without the amendment suggested by the Patent Office.

CONCLUSION

In view of the foregoing, it is believed that all claims now pending patentably define the subject invention over the prior art of record and are in condition for allowance and such action is earnestly solicited at the earliest possible date.

Respectfully submitted,

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I hereby certify that this correspondence is being deposited with the United States Postal Service on the date shown below with sufficient postage as first class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

Nedy Calderon 10/29/04  
Nedy Calderon Date